

Note : **ALL** the questions are compulsory. The programming language is C++.

1.
  - a) Expand the terms : MICR, EEPROM, UNIVAC, OCR 2
  - b) Discuss briefly about input devices i) Mouse ii) OMR 2
  - c) Discuss briefly about generation of computers. 2
  - d) Draw the functional block diagram of a computer system. Give the function of each part in brief. 2
  - e) Distinguish between impact and non-impact printers. Give one example to each. 2
  - f) Name four operating systems used in mobile phones. 2
  
2.
  - a) What is meant by an identifier in C++? From the following, which are correct examples of the identifiers? 2
    - (i) for
    - (ii) place1
    - (iii) max\_wt
    - (iv) 3rd
  - b) Which C++ header file(s) will be essentially required to be included in the following program code to run/execute the code successfully. 2

```

void main()
{
    char s[20];
    cout<<"Enter a string";
    gets(s);
    int len = strlen(s);
    cout<<"Length="<<len<<endl;
    char a = toupper(s[0]);
    cout<<a;
}

```
  - c) Distinguish between the operators i) = and == ii) && and & 2
  - d) Write a C++ program to display  $a^3$ ,  $\sqrt[3]{a}$ ,  $a^2$ ,  $\sqrt{a}$  2
  
3.
  - a) Write C++ statements for the following algebraic statements. 2
    - i)  $GF = \frac{a+b}{c} - \frac{d.e}{x.y}$
    - ii)  $v = \sqrt{\frac{3RT}{M}}$
    - iii)  $y = (a - 5)^3 \sqrt{c - 2}$
    - iv)  $h = \frac{2S \cos x}{rdg}$
  - b) Using conditional operator (:?:), construct C++ statements for the following. 2
    - i) To check given integer 'n' is an odd multiple of 9 or not.
    - ii) To display absolute value of 'n' without using library functions such as abs(), fabs() or labs().

- c) Write C++ statements for the following tasks. 3
- i) To display area & perimeter of a rectangle whose sides are length 'l' and breadth 'b'.
  - ii) To display simple interest of given Principal P, Rate of interest R and Time T
  - iii) To display sine x and cosine x where x in degree has to be in radians.

- d) Rewrite the following program after removing the syntactical errors (if any). Underline each correction. 3

```
#include [ iostream.h ]
void main()
{
    float x, y, th;
    cout << "Enter x, y = " << endl;
    cin >> x,y;
    r = sqrt(x * x + y * y);
    th = atan(y/x) * 180 / 3.14
    cout << " r = " << r << " th = " << th;
}
```

4. a) Distinguish between (i) break and exit() (ii) strlen() and sizeof() (iii) while and do-while 3

- b) Write a C++ program to display grade as shown below. 2

| Marks   | Grade       |
|---------|-------------|
| 75-100  | Distinction |
| 60 – 74 | A           |
| 50 – 59 | B           |
| <50     | Fail        |

- c) Study the following program code carefully and choose correct alternative from the options (i) to (iv). Justify your answer. Also give maximum and minimum values assigned with the variable Num. 2

```
#include <iostream.h>
#include <stdlib.h>
void main()
{
    randomize()
    int Num = random(10) + 30;
    for(int Z=35; Z<=Num; Z++)
        cout<<Z<<"*";
    cout<<endl;
}
```

- (i) 35\*36\*37\*38\*39\*40\* (ii) 35\*36\*37\*38\* (iii) 36\*37\*38\* (iv) None of the above

- d) Write a program to display all the possible roots of a quadratic equation  $ax^2 + bx + c = 0$ . 3

5. a) What is meant by nested loops in C++? Illustrate with a suitable C++ code. 2

- b) Find the output of the following program. 2

```
#include <iostream.h>
void main()
{
    int U=11, V=20;
    for(int I=1; I<=2;I++)
    {
        cout <<"LINE-1 : "<<U<<"%"<<V<<"\n";
        cout <<"LINE-2 : "<<V<<"%"<<U<<"\n";
    }
}
```

- c) Write a C++ program to generate prime numbers from 6 to 666. 2

- d) Write a C++ program to count and display number of positive and negative numbers in a list of 'n' integers using do-while loop. 2

- e) Write the following C++ code using switch statement. 2

```
if(choice == 1)
    cout<<"Jaipur"
else
    if(choice == 2 || choice == 3)
        cout<<"Udaipur";
else
    if(choice == 4 || choice == 5)
        cout<<"Jodhpur";
else
    cout<<"Invalid option";
```

6. a) Find the output of the following program code. 2

```
#include <iostream.h>
#include <ctype.h>
void main()
{
    char SMS[ ] = "UrwELCoMe"
    for(int I=0; SMS[I]!='\0';I++)
        if(islower(SMS [I]))
            SMS[I]=toupper(SMS[I]);
        else
            if(I%2==0)
                SMS[I]= SMS[I] - 1;
            else
                SMS[I]= SMS[I-1];

    cout<<"New String= " << SMS;
}
```

- b) Write a C++ program to first 'n' terms of Fibonacci series. 3  
(1,1,2,3,5,8.....)

c) Find the output of the following program code. 2

```
void main()
{
    int p =0, q=0, r=0, s=0;
    for(int t = 1; t<13; t++)
    switch(t)
    {
        case 1: p++;
        case 2: ++q; break;
        case 3:
        case 4:
        case 5:
        case 6: r++; break;
        default: ++s;
    }
    cout<<p<<"*"<<q<<"*"<<r<<"*"<<s;
}
```

d) Write a C++ program to display the following pattern. 3

```
ABCDDCBA
ABC  CBA
AB   BA
A    A
AB   BA
ABC  CBA
ABCDDCBA
```

7. a) Write C++ statements for the following tasks. 2

- i) To declare a one dimensional integer array A and initialise first 5 multiples of 5 with it.
- ii) To declare a 2-D array EVEN with row size 3 and column size 4 and initialise it with first 12 even numbers.

b) Determine storage / memory space required for the following C++ declarations. 1

- i) double B[20];
- ii) int Z[5][3];

c) Write a C++ program to check a given string is a palindrome or not 2  
(eg. DAD, MAM, NITIN)

d) Write a program to read a string and count and display number of uppercase letters stored in it. 2

e) Write a C++ program to read a 2-D array and find sum of row wise and column wise elements. 3

0o0o0o0o0o0o0o0o0